Center Independent Research & Development: GSFC IRAD

BRDF, ALBEDO, CLOUD AND AEROSOL RADIOMETER (BACAR)

Completed Technology Project (2012 - 2013)

Project Introduction

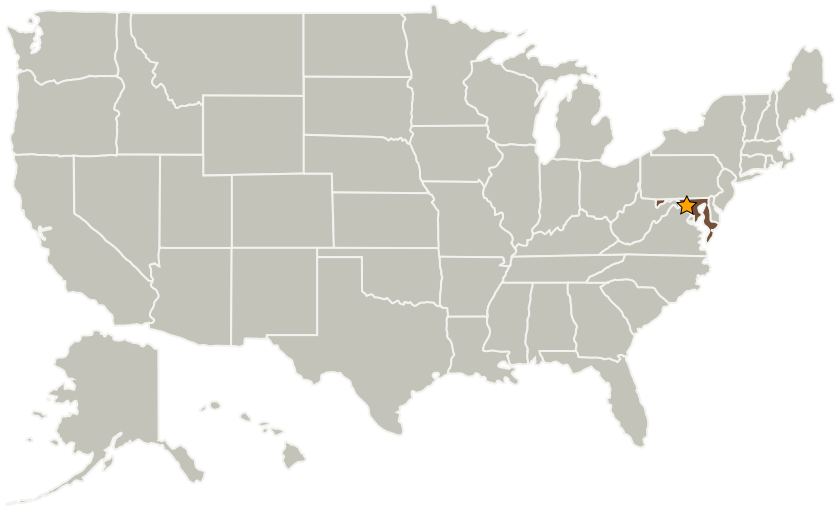
The proposed airborne instrument, BACAR (BRDF: bidirectional reflectance-distribution function, Albedo, Cloud and Aerosol Radiometer) will demonstrate radiometrically accurate measurements from the Ultraviolet to Thermal Infrared (19 channels), including polarization, from a single instrument, which is unprecedented, and will overcome significant technological challenges in optical design with high optical throughput and SNR (signal-to-noise ratio), as well as fast data readouts and processing. BACAR will expand the current CAR (Cloud Absorption Radiometer) airborne science capability and build on its BRDF legacy in important ways that will have particular impact in the following areas: (i) snow & ice mapping, (ii) wildfires, (iii) natural resources mapping, (iv) volcano monitoring, (v) surface-temperature determination & radiation balance constraints, (vi) cloud studies, (vii) air pollution studies, and (viii) acute pollution-event monitoring.

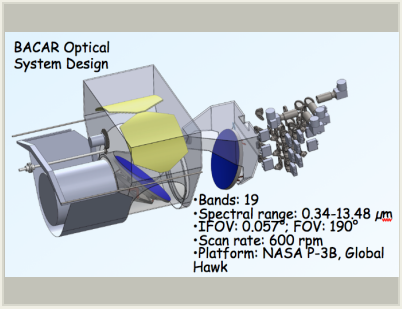
The entire BACAR project is organized following a standard design/build top-level process that includes: conceptual design, trade studies, preliminary design, critical design and fabrication/test.

Anticipated Benefits

BACAR will become a powerful tool for new measurements and discoveries because of its unique characteristics. It will also provide ground truth validation and calibration support for existing on-orbit assets (MODIS, MISR, LandSat, JPSS, etc.).

Primary U.S. Work Locations and Key Partners





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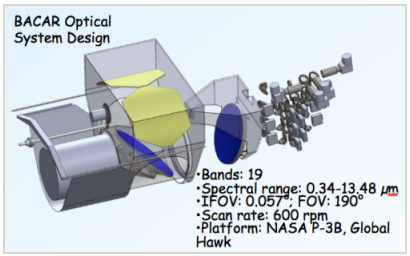
Completed Technology Project (2012 - 2013)

Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Universities Space Research Association Division of Life Sciences(USRA-DSLS)	Supporting Organization	Academia	Huntsville, Alabama

Primary U.S. Work Locations
Maryland

Images



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BRDF, ALBEDO, CLOUD AND AEROSOL RADIOMETER (BACAR)
(https://techport.nasa.gov/image/1888)

Links

NTR 1
(https://technology.grc.nasa.gov/techdays2012/technologies.shtm)

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

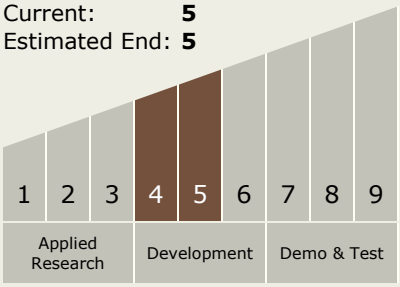
Program Manager:
Peter M Hughes

Project Manager:
Matthew J Mcgill

Principal Investigator:
Ralph A Kahn

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



BRDF, ALBEDO, CLOUD AND AEROSOL RADIOMETER (BACAR)

Completed Technology Project (2012 - 2013)

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.7 Test Instruments and Sensors